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Periorbital burns – A 6 year review of management and outcome

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ABSTRACT

Introduction: Periorbital burns are an infrequent but potentially devastating injury. This study aimed to elucidate the spectrum of such injuries presenting to a UK burns centre and the outcome achieved in the cases requiring periorbital reconstruction for the restoration of function and form.

Methods: Patients admitted to a UK regional burns centre between January 2005 and January 2011 with periorbital burns were identified from the Patient Administration System (PAS), theatre logs and the International Burns Injury database (IBID). Multiple parameters were assessed using patient notes, ITU and hospital image databases.

Results: Over 6 years, 167 patients with facial burns requiring surgery were treated, including 103 patients with eyelid burns. The mean burn size was 33% total body surface area. The eyelid burn depth varied; 67% superficial partial thickness, 17% deep dermal and 16% full thickness. Two patients lost complete vision in one eye, one patient underwent amniotic membrane grafting. In total 16 patients required periorbital reconstruction to maintain eye closure, with 1.8 operations on average per patient. Acute surgery was required in 11 patients, whilst late intervention (>3 months) was needed in 5, 2 patients had both acute and delayed surgery. Of the 5 late intervention patients 4 were treated with full thickness skin grafts and 1 with a Z plasty. Average time for final reconstruction with delayed surgery was 4.5 months.

Conclusion: The goal in management of periorbital burns is preservation of vision, prevention of future complications and restoration of an acceptable aesthetic outcome. Total visual loss is thankfully rare, but early ophthalmology intervention is vital given the evidence of corneal damage as a brief therapeutic window exists.

1. Introduction

The face is a frequent site for burns. These injuries are associated with potentially significant medical and psychological morbidity. Ocular and periorbital adnexal injury has been shown to occur after up to 20% of facial thermal burns [1]. Periorbital burns are infrequent but potentially devastating. The blink reflex and Bells reflex [2] provide automatic mechanisms to protect vulnerable ocular tissue.

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Acute globe injury following thermal burns may be present due to the absence of these protective reflexes in the obtunded patient, or when reflexes are consciously suppressed in order to visualise an escape route in a fire [3]. The diagnosis and early treatment of corneal injury is essential. However, ocular injuries are often just one component of a larger burn and essential early life saving interventions can distract from measures directed towards preserving vision. Periorbital burns can result in cicatrical healing and the distortion of soft tissue around the eye. Late complications of eyelid burns include ectropion and lagophthalmos as a result of secondary burn contractures [4]. Significantly, this can result in further corneal damage and risk to sight.

A large number of operative procedures exist for managing these injuries. The choice and timing remain a matter of contention. We surveyed the spectrum of such injuries presenting to a large Regional Burns service in the United Kingdom. Additionally, we reviewed both the short and long term outcomes of periorbital burns with particular focus on those patients who required reconstruction.

2. Methods

A retrospective case-note analysis was performed to identify all patients with periorbital burns admitted to a UK regional burns centre between January 2005 and January 2011. Patients were identified using a number of sources: St. Andrews Centre for Plastic Surgery & Burns Patient Administration System (PAS) utilising the ICD-10 Codes T26.0–T26.9, T20.0–T20.7; theatre log books; and the International Burns Injury database (IBID). Periorbital anatomy was defined as seen in Fig. 1.

Multiple parameters for each patient during their entire hospital admission and subsequent post discharge treatment were analysed. Patient data were retrieved from hospital notes, our Burns Intensive Care database, ''Metavision'' (iMD*soft* Massachusetts, USA), and hospital image databases. Variable collected are shown in Table 1. Patient demographic data included age and gender. Injury data included: date, time and mechanism of burn; clinical estimate of depth and size of burn (total body surface area percentage – TBSA%); corneal burn grade using The Dua Classification [5]; length of stay and mortality. Periorbital burns data included: laterality; eyelid injury; ocular surface injury. Identified management parameters included: corneal assessment at admission; prophylactic use of eye protective measures; timing of first specialist ophthalmological input; date and form of operative intervention; acuity on discharge; and necessity for late reconstruction. Isolated ocular injuries and burns were excluded.

The data were analysed to review the incidence and outcomes of periorbital burns treated within our department and also to elucidate the relationship between early intervention and long term eye function.

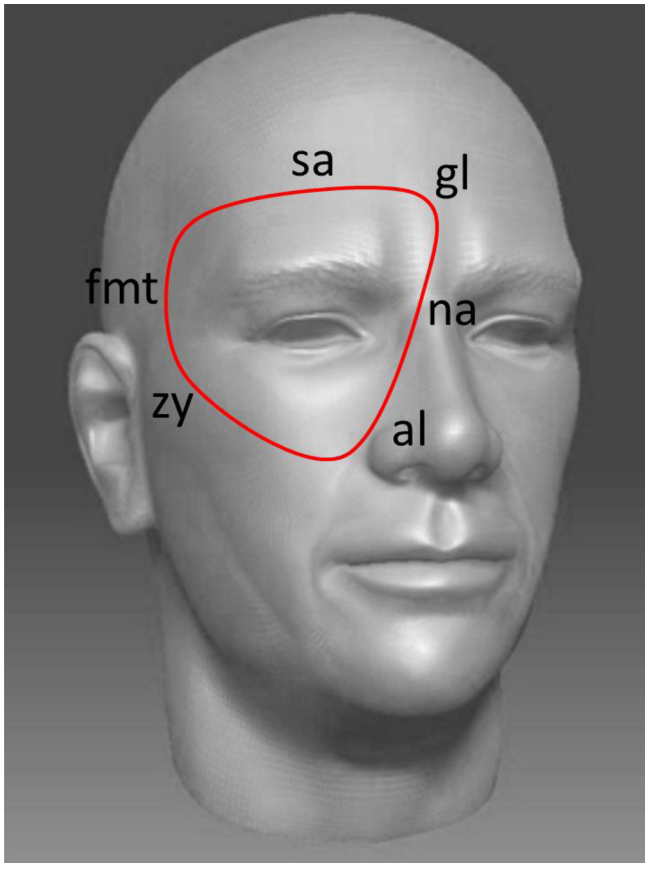

Fig. 1 – The anatomical boundaries of the periorbital region – the area surrounding and including the eye orbit delineated by the following established landmarks: superciliary arch (sa), glabella (g), nasion (n), alare (al), zygion (zy), and frontomalare temporale (fmt).

Table 1 – Variables assessed from case notes review.

Variables assessed		
Demographic data	Opthalmic data	Management
Age	Laterality	Wound management types
Sex	Eyelid injury	Reconstruction undertaken
Burn time	Ocular injury	Reconstruction timing
Burn mechanism	Corneal burn grade	
Burn depth	Opthalmic assessment	
Burn size	Prophylactic antibiotic use	
Corneal burn grade	Protective eye measures	
Length of stay	Acuity on discharge	
Mortality		